

Amendments to the Claims

Please cancel claims 49-51, 54, 56, 59-63, 65-74, 79 and 88, amend claims 1, 3-24, 28-29, 52-53, 55, 57-58, 64, 75-78 and 80-87, and add new claims 89-91. The changes in these claims from their immediate prior version (not considering the August 5, 2003 amendment because it was not entered) are shown with ~~striethrough~~ or [[double brackets]] for deleted matter and underlines for added matter. A complete listing of the claims with proper claims identifiers follows.

Listing of Claims

1. (Currently amended) A hard disc drive comprising:
 - i) a read/write head and
 - ii) a spindle motor, the spindle motor comprising:
 - a) a baseplate;
 - b) a shaft supported by said baseplate;
 - c) a stator assembly comprising
 - i) a core having poles and
 - ii) windings around said poles;
 - iii) the stator core being rigidly attached to said baseplate;
 - d) injection molded thermoplastic material substantially encapsulating said windings and contacting the baseplate such that the windings, core and baseplate are rigidly fixed together, said thermoplastic having a modulus of elasticity of at least 1,000,000 psi at 25°C; and
 - e) a hub supported on said shaft, said hub having a magnet connected thereto in operable proximity to the stator assembly.
2. (Canceled)
3. (Currently amended) The hard disc drive spindle motor of claim 1 wherein the baseplate is made of aluminum.
4. (Currently amended) The hard disc drive spindle motor of claim 1 wherein the stator assembly is rigidly attached to the baseplate by being rigidly attached to a support member secured to said baseplate.

5. (Currently amended) The hard disc drive spindle motor of claim 4 wherein the thermoplastic encapsulating the windings is adhered to said support member and said baseplate.

6. (Currently amended) The hard disc drive spindle motor of claim 1 wherein the thermoplastic used in the encapsulation has a vibratory dampening ratio of at least 0.05 in the range of 0-500 Hz.

7. (Currently amended) The hard disc drive spindle motor of claim 1 wherein the thermoplastic also encapsulates the stator core except where it is rigidly attached to the baseplate.

8. (Currently amended) The hard disc drive spindle motor of claim 1 wherein the hub is rotatably supported on said shaft by ball bearings interposed between the hub and the shaft.

9. (Currently amended) The hard disc drive spindle motor of claim 1 wherein the thermoplastic material provides a heat sink and heat conductive path from the stator assembly to the baseplate.

10. (Currently amended) A hard disc drive comprising:

i) a read/write head and

ii) a spindle motor, the spindle motor comprising:

- a) a baseplate;
- b) a shaft supported by said baseplate;
- c) a stator assembly comprising
 - i) a core having poles and
 - ii) windings around said poles,

the baseplate and stator assembly not being in direct contact with one another but rather the stator assembly being spaced from the baseplate;

d) a hub supported on said shaft, said hub having a magnet connected thereto in operable proximity to the stator assembly; and

e) a thermoplastic material secured to the baseplate and substantially encapsulating the stator windings, the thermoplastic material joining the stator assembly to the baseplate in the space between the stator assembly and the baseplate, filling in the space between them such that the windings, core and baseplate are rigidly fixed together.

11. (Currently amended) The hard disc drive spindle motor of claim 10 wherein the baseplate has a plurality of holes through it and the thermoplastic material is secured to the baseplate by filing in said holes.

12. (Currently amended) The hard disc drive spindle motor of claim 11 wherein the holes are enlarged on the side of the baseplate opposite to the stator assembly in order to lock the thermoplastic to the baseplate.

13. (Currently amended) The hard disc drive spindle motor of claim 10 wherein the magnet is located inside of the stator assembly.

14. (Currently amended) The hard disc drive spindle motor of claim 10 further comprising upper and lower bearings and wherein the hub comprises an outer member having an inside aperture and a ferrule fixed inside said aperture and connected directly to the bearings.

15. (Currently amended) The hard disc drive spindle motor of claim 14 wherein the magnet is attached to the ferrule.

16. (Currently amended) The hard disc drive spindle motor of claim 14 wherein bearings are interposed between the shaft and the ferrule.

17. (Currently amended) The hard disc drive spindle motor of claim 14 wherein the hub outer member is comprised of aluminum and the ferrule is comprised of steel.

18. (Currently amended) The hard disc drive spindle motor of claim 10 wherein the core comprises steel laminations.

19. (Currently amended) The hard disc drive spindle motor of claim 10 wherein the hub comprises a hard drive disc support member.

20. (Currently amended) The hard disc drive spindle motor of claim 10 wherein the thermoplastic material includes ceramic particles.

21. (Currently amended) The hard disc drive spindle motor of claim 10 wherein the thermoplastic material has a coefficient of linear thermal expansion of less than 2×10^{-5} in/in °F throughout the range of 0-250°F.

22. (Currently amended) The hard disc drive spindle motor of claim 10 wherein the thermoplastic material has a thermal conductivity of at least 0.7 watts/meter °K at 23°C.

23. (Currently amended) The hard disc drive spindle motor of claim 10 wherein the thermoplastic material has a dielectric strength for at least 250 volts/mil.

24. (Currently amended) The hard disc drive spindle motor of claim 10 wherein the thermoplastic material has a vibration dampening ratio of at least 0.05 in a frequency range of 0-500 Hz and a modulus of elasticity of at least 1,000,000 psi at 25°C.

25-27. (Canceled)

28. (Currently amended) The hard disc drive spindle motor of claim 10 wherein the baseplate comprises a stiff thermoplastic material, having a modulus of elasticity of at least 1,000,000 psi, and a metal plate substantially encapsulated in the stiff thermoplastic material.

29. (Currently amended) The hard disc drive spindle motor of claim 28 wherein the stiff thermoplastic material is the same material as is used to encapsulate the windings.

30. (Original) A spindle motor comprising:

- a) a baseplate made of stiff thermoplastic material, having a modulus of elasticity of at least 1,000,000 psi at 25°C, and a metal plate substantially encapsulated by the stiff thermoplastic material;
- b) a shaft supported by said baseplate;
- c) a stator assembly comprising
 - i) a core having poles and
 - ii) windings around said poles;
- d) a hub supported on said shaft, said hub having a magnet connected thereto in operable proximity to the stator assembly; and
- e) a vibration dampening thermoplastic material encapsulating the stator windings, the vibration dampening thermoplastic material having a vibration dampening ratio of at least 0.05 in the range of 0-500 Hz and joining the stator assembly to the baseplate.

31. (Original) The spindle motor of claim 30 wherein the stiff thermoplastic material is the same material as the vibration dampening thermoplastic material.

32. (Original) The spindle motor of claim 30 wherein the vibration dampening material has a vibration dampening ratio of at least 0.1 in the range of 0-500 Hz.

33. (Original) The spindle motor of claim 30 wherein the vibration dampening thermoplastic material has a vibration dampening ratio of at least 0.3 in the range of 0-500 Hz.

34. (Original) The spindle motor of claim 30 wherein the vibration dampening thermoplastic material has a vibration-dampening ratio of at least 0.5 in the range of 0-500 Hz.

35. (Original) The spindle motor of claim 30 wherein the stiff thermoplastic material has a modulus of elasticity of at least 2,000,000 psi at 25°C.

36. (Original) The spindle motor of claim 30 wherein the stiff thermoplastic material has a modulus of elasticity of at least 3,000,000 psi at 25°C.

37. (Original) The spindle motor of claim 30 wherein the hub is rotatably supported on the shaft and the shaft is rigidly attached to the baseplate.

38-51. (Canceled)

52. (Currently amended) The hard disc drive spindle motor of claim 1 wherein the shaft is rotatably supported by the baseplate and the hub is rigidly attached to the shaft.

53. (Currently amended) The hard disc drive spindle motor of claim 10 wherein the magnet is adjacent an inside diameter of the stator.

54. (Canceled)

55. (Currently amended) The hard disc drive of claim [[54]] 1 wherein the baseplate of the motor also constitutes the baseplate of the hard drive housing.

56. (Canceled)

57. (Currently amended) A hard disc drive including the motor of claim 30.

58. (Currently amended) The hard disc drive spindle motor of claim 17 wherein the steel ferrule acts as flux return ring for the motor.

59-63. (Canceled)

64. (Currently amended) The hard disc drive spindle motor of claim 10 wherein the thermoplastic used in the encapsulation has a vibratory dampening ratio of at least 0.05 in the range of 0-500 Hz.

65-74. (Canceled)

75. (Currently amended) The hard disc drive spindle motor of claim 1 wherein the thermoplastic material has a modulus of elasticity of at least 2,000,000 psi at 25°C.

76. (Currently amended) The hard disc drive spindle motor of claim 1 wherein the thermoplastic material has a modulus of elasticity of at least 3,000,000 psi at 25°C.

77. (Currently amended) The hard disc drive motor of claim [[62]] 10 wherein the thermoplastic material has a modulus of elasticity of at least 2,000,000 psi at 25°C.

78. (Currently amended) The hard disc drive motor of claim [[62]] 10 wherein the thermoplastic material has a modulus of elasticity of at least 3,000,000 psi at 25°C.

79. (Canceled).

80. (Currently amended) A hard disc drive comprising:

i) a read/write head and

ii) a spindle motor, the spindle motor comprising:

a) a baseplate made of stiff thermoplastic material, having a modulus of elasticity of at least 1,000,000 psi at 25°C, and a metal plate substantially encapsulated by the stiff thermoplastic material;

b) a shaft supported by said baseplate;

c) a stator assembly comprising

i) a core having poles and

ii) windings around said poles;

d) a hub supported on said shaft, said hub having a magnet connected thereto in operable proximity to the stator assembly; and

e) a vibration dampening thermoplastic material encapsulating the stator windings, the vibration dampening thermoplastic material having a vibration dampening ratio of at least 0.05 in the range of 0-500 Hz and joining the stator assembly to the baseplate.

81. (Currently amended) The hard disc drive motor of claim 80 wherein the stiff thermoplastic material is the same material as the vibration dampening thermoplastic material.

82. (Currently amended) The hard disc drive motor of claim 80 wherein the vibration dampening material has a vibration dampening ratio of at least 0.1 in the range of 0-500 Hz.

83. (Currently amended) The hard disc drive motor of claim 80 wherein the vibration dampening thermoplastic material has a vibration dampening ratio of at least 0.3 in the range of 0-500 Hz.

84. (Currently amended) The hard disc drive motor of claim 80 wherein the vibration dampening thermoplastic material has a vibration-dampening ratio of at least 0.5 in the range of 0-500 Hz.

85. (Currently amended) The hard disc drive motor of claim 80 wherein the stiff thermoplastic material has a modulus of elasticity of at least 2,000,000 psi at 25°C.

86. (Currently amended) The hard disc drive motor of claim 80 wherein the stiff thermoplastic material has a modulus of elasticity of at least 3,000,000 psi at 25°C.

87. (Currently amended) The hard disc drive motor of claim 80 wherein the hub is rotatably supported on the shaft and the shaft is rigidly attached to the baseplate.

88. (Canceled)

89. (New) A spindle motor comprising:

- a) a baseplate;
- b) a shaft supported by said baseplate;
- c) a stator assembly comprising
 - i) a core having poles and
 - ii) windings around said poles,

the baseplate and stator assembly not being in direct contact with one another but rather the stator assembly being spaced from the baseplate;

d) a hub supported on said shaft, wherein the hub comprises a hard drive disc support member, said hub having a magnet connected thereto in operable proximity to the stator assembly; and

e) a thermoplastic material secured to the baseplate and substantially encapsulating the stator windings, the thermoplastic material joining the stator assembly to the baseplate in the space between the stator assembly and the baseplate, filling in the space between them such that the windings, core and baseplate are rigidly fixed together.

90. (New) A spindle motor comprising:

- a) a baseplate comprising a stiff thermoplastic material, having a modulus of elasticity of at least 1,000,000 psi, and a metal plate substantially encapsulated in the stiff thermoplastic material;
- b) a shaft supported by said baseplate;
- c) a stator assembly comprising
 - i) a core having poles and
 - ii) windings around said poles,the baseplate and stator assembly not being in direct contact with one another but rather the stator assembly being spaced from the baseplate;
- d) a hub supported on said shaft, said hub having a magnet connected thereto in operable proximity to the stator assembly; and
- e) a thermoplastic material secured to the baseplate and substantially encapsulating the stator windings, the thermoplastic material joining the stator assembly to the baseplate in the space between the stator assembly and the baseplate, filling in the space between them such that the windings, core and baseplate are rigidly fixed together.

91. (New) The spindle motor of claim 90 wherein the stiff thermoplastic material used in the baseplate is the same material as is used to encapsulate the windings.

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